Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

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USEFUL RECEIPTS.

Copper and Tin Mixtures.

The best mode of mixing the component metals of this alloy appears to be to melt each separately, and then to add the tin to the copper at the lowest stirring temperature. To complete the combination, the alloy is again melted very gradually by placing the metal in the crucible almost as soon as the fire is lighted. The hardness of this alloy, compared with the extreme softness of the metals, gives us an example of the chemical changes effected by their combination. Thus, the speculum metal, as used by Lord Rosse, is totally devoid of malleability, and from its hardness cannot be acted on by the file. His speculum consisted of four atoms of chemical combining proportions of copper to one of tin; or, by weight, 126 4 copper to 58·9 tin. This alloy, which is a true chemical compound, is of a brilliant white lustre, its specific gravity 8·811, nearly as hard as steel, and almost as brittle as sealing-wax. The speculum is 6 feet in diameter 5 inches thick. It was east open, ground with emery, placed on a table in a cistern filled with water at a temperature of 55° Fah., polished with red oxide of iron, procured by precipitation from green vitriol, or sulphate of iron, by water of ammonia.

Best's Patent Reverberatory Furnace.

Figure 1 is an outside longitudinal view of the furnace, with the plates of the hot-air passages removed, and fig. 2 is a vertical longitudinal section, showing the interior. The patentee of this invention is Christopher G. Best, of the City of Albany, N. Y.; the patent was granted on the first of last August, but the engravings represent an improvement made since the patent was issued for heating the air for combustion before it enters the furnace, by making it pass around the chimney. The same letters on both figures refer to like parts. The nature of the patented improvement consists in having a separate chamber from that of the fire, in which the metal to be smelted is placed, the fire being near to the metal, and the heat of the fire being made to act upon and pass down through the whole of the metal in the furnace, thus enabling the heat or products of combustion to act more evenly and to be more thoroughly diffused throughout the whole stack of metal than in furnaces which are in common use. In fig. 2, the metal to be smelted is built up in the stack merely to show the operation of the fire and heat passing down through it, as indicated by the arrow. The molten metal flows away down the inclined plate at the back of the furnace, and the heated gases pass away, up the chimney, D. New iron is fed in through the man-hole, C, and the fire doors are placed at the end of the furnace; there is a large deep ash-pit below the fire-bars. There is a complete circulation of the air in the furnace; the air to support combustion is represented by the arrows, moving from right to left, then into the fire where it unites with the carbon of the fuel forming carbonic acid, and then passes out, as has been stated, from left to right. The cold

Figure 1.

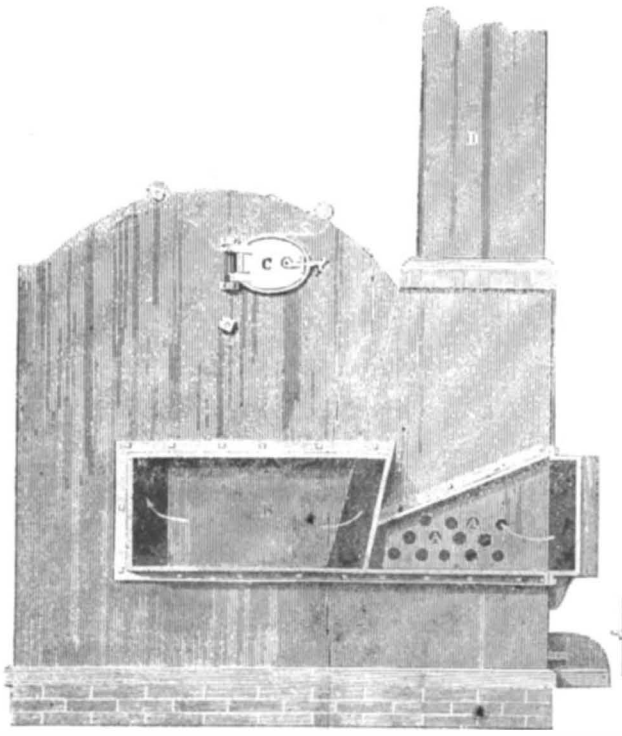
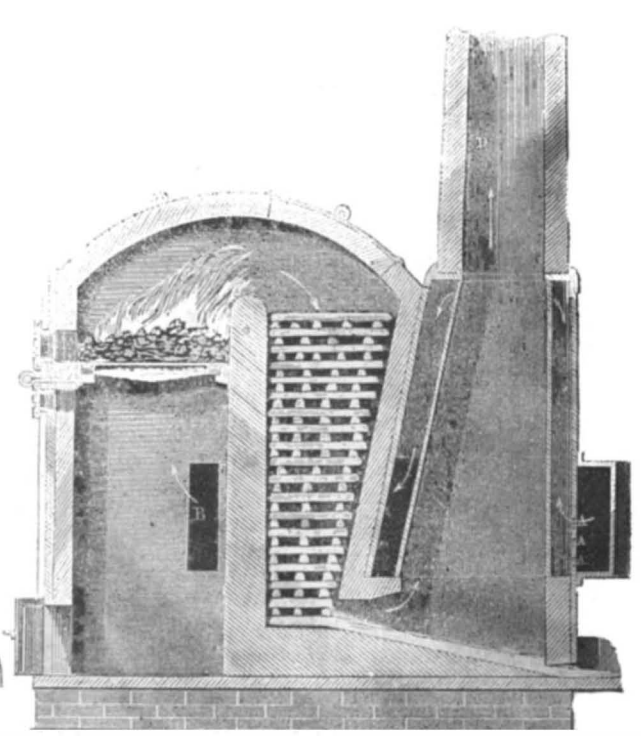


Figure 2.



air to feed the fire is fed in by a blower through the perforations, A A, in plates around the chimney, D, then it passes up and down on the opposite side of the chimney, as shown by the arrows (the plate at the one side, to guide the air, is not shown, but will easily be understood), then passes over the outside of the metal stack by the passage way, B, in for and up through the ash-pit into the fire a the air is thus highly heated before it enters the fire and by such heat as would otherwise be wasted, by which operation a great quantity of fuel is saved.

The construction of this reverberatory furnace allows it, like a cupola, to be charged at intervals. It will answer for anthracite or bituminous coal, and can be used either as a draft furnace, simply, of as a blast furnace. The pigs to be melted are placed three or four inches apart. Reverberatory furnaces make superior iron, but they are expensive, —this furnace is designed for cheapness as well as superior action. After the first charge, the remaining iron is thrown in promiscuously. The plates which form the air chamber around the chimney, have prods cast on them, and one side of the plate is covered with fire-clay to prevent it from melting. The furnace is built with the materials best known and in common use to resist the destructive action of the heat, as the products of combustion in the state of flame or gas, are alone applied to reduce the metal in the chamber the smelter has complete control over the metal to reduce it in the manner which he considers most appropriate. this furnace may be built of a square form, but the circular form is the best, for Best's improved furnace, as here represented.

More information respecting this excellent furnace may be obtained by letter addressed to the patentee.

ECHOL'S STEAM GAUGE.

Figure 1.

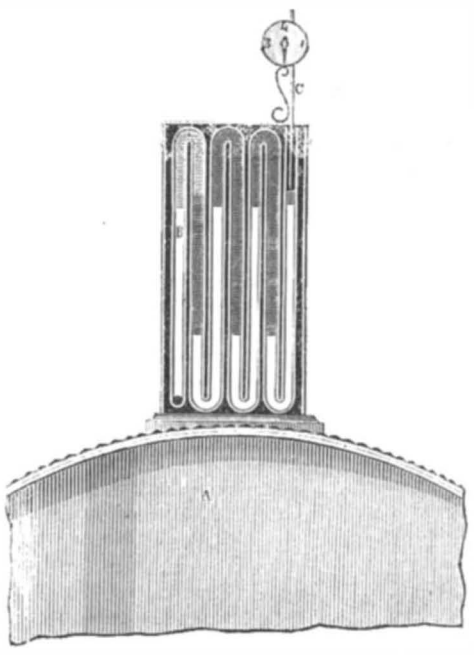
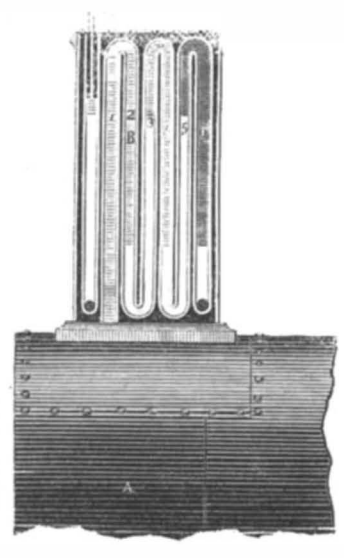


Figure 2.



The annexed engravings represent a mercury steam gauge, invented by Josephus Echols, of Columbus, Ga., who has taken measures to secure a patent. The important features of the improvement consist in so constructing the gauge that a very long heavy column of mercury may be used in a small space to exert its pressure upon the steam in the boiler. Figures 1 and 2 are each sectional elevations of the gauge, connected with portions of a steam boiler, one view being taken from the end of the boiler, and the other from the side.

A is the boiler, and B is an iron pipe, which may be of a length and size required, according to the pressure of the steam per square inch, for 125 lbs. pressure, say 41 feet long, and 1-4 inch diameter; this pipe or tube is folded up, as shown in the engravings, and may be made to occupy but a very small amount of space; its convolutions may assume a square, round, or any other desired form, or any required height. A suitable case may surround this gauge, resting upon the boiler, as shown in the engravings. The light portions of the tube, as at 3 and 5, represent mercury, and the darker, as at 4 and 6, represent oil or water introduced between the columns of mercury; 1 and 2 represent the steam from the boiler which presses directly upon the column of mercury, shown at 3, which column, in turn, presses upon 4, of oil or water, 4 again upon 5, and 5 upon 6, and so on, during a greater or less number of convolutions until the pipe arrives at the steam indicator, which is simply a float with a vertical rod, C, attached, which passes over a graduated scale or by the side of a graduated disc plate, as represented. It should be observed that the columns of water or oil, occupy the whole of the upper half of all the convolutions of the tube, except the end, where the steam is admitted, and the lower half of the same is occupied by mercury when there is no pressure in the boiler; when the pressure is added the water and mercury assume the form represented. It will be perceived that the length of all the columns of mercury added together will be the amount of resistance to the pressure of the steam, as though the whole were a single column of mercury of the length of all these added together: this will, no doubt, operate satisfactorily, and is a very good invention.

Further information may be obtained by letters addressed to the inventor.

The President has approved of Captain Meigs's plan for an aqueduct to supply Washington and Georgetown with water, capable of supplying one hundred millions of gallons per day; the work will be prosecuted with vigor.

The Washington correspondent of the New York Journal of Commerce, states that the grave of James Madison, twice President of this Republic, cannot now be recognized.—This is a shame.

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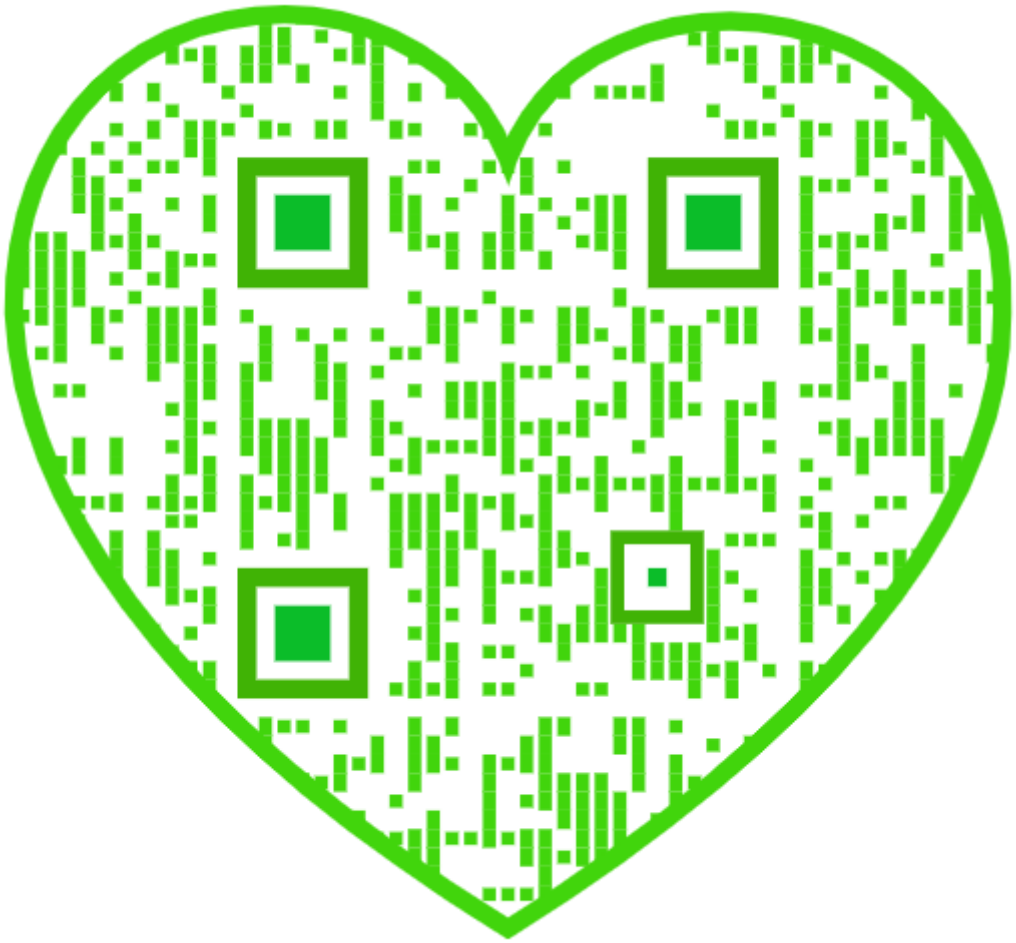

MISCELLANEOUS.

Health and Heat.

There have been some exceedingly warm days during the past month, and we have heard many old people say, "they were the warmest of any within their recollection." We understand that this extreme heat has not been confined to one district of our country, but has been felt in a number of the States—South and North. In Charleston, S. C., the mercury has been as high as 101° in the shade—a heat of atmosphere about as high as that of the blood, and at which a white person is almost rendered incapable of breathing. The mortality in our cities, especially, is greatest during the warmest months. There is also more disease and sickness during such weather. Many causes contribute to this result, but means may be adopted to prevent, at least in a measure—such evils. Excess is the cause of much disease—temperance in all things, is the grand preventive. In warm weather, fat meats, and alcoholic drinks are dangerous, because these contain a great deal of carbon—the heat sustainer of the body and are therefore least necessary in hot weather. Excess of physical and mental labor should also be avoided in warm weather, one extreme is enough for the human frame to endure at once. Citizens, who seek recreation in the country should avoid. for the first few days, any extraordinary effort, and should not walk, ride, or sail, for more than one hour at once in hot sunshine. We believe that many people, especially in our cities, do themselves great injury by excessive drinking, and not that of alcoholic beverages alone, but mixed drinks of various kinds, beers, soda waters, &c., and cold water. The Arab who endures with such constancy the burning heat of the desert, is a moderate man in his drink; but while we say this much, it is impossible for any person to go through very violent exercise in hot weather, without drinking a great deal of some liquid. Our farmers, in general, are very prudent in this respect; the majority of those who die in New York City, from overheating themselves, are foreigners.

Our object in writing this article, at present, is to direct attention to the benefits of moderation—temperance in all things—as we hold it to be the grand safe-guard of health, and during the hot months of the year, people are very often tempted to forget and neglect the practice this virtue.

A Novel Bathing Apparatus.

Our hydropathic friends will be surprised to learn that the almost numberless vessels heretofore used for bathing, in taking the different kinds of baths, may be rendered quite useless, by one apparatus, which subserves the purpose of all the bathing utensils formerly requisite, besides a variety of other purposes—in fact it assumes about as many shapes and forms as Proteus had; our correspondent who is now constructing it, thus enumerates the different purposes to which it may be applied, within the small compass of 6 feet in length, 2 feet wide, and 2½ or 3 feet high:—"I combine all the following qualities in one and the same apparatus, and so construct it that it can be changed to either of these forms, at pleasure in a moment's time—first, a vessel for an immersion bath; 2nd, a shower bath; 3rd, a sitz bath; 4 a head bath; 5th, a foot bath; 6th, a cataract bath; 7th, any other form of bath desired, a hose, &c.; 8th, a bureau; 9th, a secretary, 10th, a dressing-stand and mirror; 11th, a wash-stand, bowl, and sink; 12th, a writing table; 13th, a hat and coat hanger; 14th, an umbrella stand spittoon &c." It is stated that the article is nearly complete. No material is used that will be effected by the cold or hot water, or that will corrode, or emit an unpleasant odor. All is represented as substantial and durable. This must be a remarkably novel and ingenious invention; it will probably be more particularly noticed hereafter.

Texas Salt.

We received yesterday from Corpus Christi, through the kindness of Capt. Parker, of the schooner Star, a sample of salt taken from a salt lake about seven miles from that place. It is a part of a quantity sent to the editors of the Nueces Valley paper, published at Corpus Christi. Those gentlemen were kind enough to favor us with this specimen. It is clear colored, clean, well crystallized, and of good taste. The editors of the Nueces Valley say they are informed that the supply of it at the lake in question is inexhaustible. Small boats can run up to the beds, and one hundred bushels is the average product in the land per diem.—New Orleans Picayune, June 28.

Manufactures of New Hampshire.

There are in this State 44 cotton establishments in operation, covering an investment of $10,950,560; manufacturing 113,106,247 yards of cloth, using 93,026 bales of cotton; consuming 7,679 tons of coal; involving a value of raw material of $4,839,429; employind 2,912 male, and 9,211 female operatives; disbursing to the former $75,713, and to the latter $124,-131 per month; making an average to the males of 25 45, and to the females $13 47 per month; and producing an aggregate value of products of $8,830,619. Woolen establishments, 61; investments, $2.437,700; yards of cloth manufactured, 9,712.840; pounds of wool used, 3,604,103; tons of coal, 3,600; value of raw material, $1,267.293; number of males employed, 926; females, 1,201; entire wages per month, males, $21,177; females; $17,451; average wages per month for the former, $22 84; the latter, $17 51; value of the entire products, $2,127,745.

Tobacco Seed Oil.

Foreign papers state that a British resident in Russia, who is a member of the Imperial Geographical Society of that country, and gardener to his Excellency, General Vsvolodjsky, near Kizlior, has found, by experiment, that the seed of the tobacco plant contains about fifteen per cent of an oil that has superior desiccative qualities, which may be employed with advantage in paints and varnishes. The process of extraction is said to be simple and easy, requiring only a reduction of the seed to powder, which is to be kneaded into a stiff paste, with a sufficient quantity of hot water, and afterwards submitted to the action of a very strong press. The oil, when expressed, is exposed to a moderate heat, which, coagulating the vegetable albumen of the seed, precipitates all the impurities to the bottom of the vessel, leaving the oil in a perfectly clear and limpid state.

There is nothing particularly new in this discovery.

Population of Britain.

The Census of Great Britain, in 1851, has just been published in two thick volumes.—The number of people returned were 21,121,-967, of whom 10,386.048 were males, 10,735,-916 females, thus giving the ladies the advantage. On the night of the census, 12,924 were sleeping on barges, (vessels,) 9,972 in barns, and 8,277 in the open air or under tents. The number of families in Great Britain were 4,312,388; inhabited houses, 3,648,347. The towns, villages, &c., in Great Britain, 17,150. The British isles 500; inhabited, 175. Great Britain has upwards of 21,000,000, and Ireland upwards of 6,000,000 of souls. Anglesey Jersey, and the Isle of Man have 50,000, and Guernsey, Lewis, Skye, and Shetland over 20,000. These numbers, however, rapidly descend in the remaining islands from 10,000 1,000, 500, 400, 100, 40, 20, 10; and finally, at Inchcalm, an appanage of Fife, there is an island with one man only on it.

Trial of Reaping and Mowing Machines.

We learn from the "Germantown Telegraph," that a trial of reaping and mowing machines took place on the 31st ult., at Flourtown, Montgomery Co., Pa., which was well attended by the farmers of several counties and by Professor Wilson, one of the British Commissioners to the New York Exhibition, who is said to possess much knowledge of agriculture, and who appeared to feel much, interest in the operations of the day. For mowing, but two machines were entered; and of these, Ketchum's proved the favorite. For reaping, but three machines entered, two of Hussey's patent, and one of Seymour's. The former worked admirably, but required seven men to bind and clear the track for each machine, as it throws the grain behind instead of at the side. The "Norristown Herald" says that the trial was unsatisfactory to the spectators, and the "Germantown Telegraph" conveys the same impression. The judges awarded the premium of $50 to Seymour's combined mower and reaper. According to the "Bucks County Intelligencer," 2,000 spectators were present.

At Mount Holly, N. J., on Saturday the 2nd inst., another trial of reaping machines took place under the auspices of the Burlington County Agricultural Society, at which a very large number of Jersey farmers were present. For mowing, Ketchum's machine proved the favorite there also. For reaping, Hussey's and McCormack's machines were tried and worked very well, the latter appearing to be the favorite among the farmers.—Such exhibitions have resulted in the diffusion of a better knowledge of the subject among the agricultural fraternity, and have produced a more general disposition to adopt agricultural machinery.

Fair of the American Institute.

The Managers of the Institute, we see, are determined to give the Crystal Palace a rub in competition, in the month of October next. The 26th Annual Fair will be held in the old place—Castle Garden—commencing on the 6th of that month. We see by the card of the Managers that they claim the merit of originating World's Fairs. Prince Albert, who originated the World's Fair in London, may put that in his pipe and smoke it, if he pleases. We perceive that no Ray premiums are offered this year, and not a word is said about railroad inventions. Nevertheless, we must say, the Institute has done good, if by misrepresentation in calling out railroad inventions. This was done upon the principle, we suppose, of "doing evil that good might come." We hope the Institute will have a good Fair. $500 have been appropriated as rewards for ingenious works of apprentices and minors—a course of policy which we esteem highly, and for which the Managers deserve credit.

Some have called the Institute "Old Fogy," but this Fair will show to the world, that this epithet will be wiped out by a zealous activity and patriotic devotion worthy of patriots determined to conquer or die in a good cause—leaving out the Ray Premiums.

The Safest Seat in a Car.

The frequency of collisions on railroads has raised the question, which is the place of greatest security in a railroad train? The Railroad Journal gives the following as an answer:—

"It is very well known that the car nearest the engine is exposed to the least dust, and that the rear car of a train is generally safer than the front car. The safest is probably the last car but one, in a train of more than two cars; that is, there are fewer chances of accidents to this than any other.

If it is a way train at moderate speed, or any train standing still, a collision is possible from another train in the rear; in which case the last car receives the first shock.—Again, an engine and the front cars of a train will often go over a broken rail, or a cow, or stone, without derailment, while the last car, having nothing to draw it into the line of the train, is free to leave the track. Next to the forward car the rear car is probably the most unsafe in the train. The safest seat is probably near the centre of the last car but one, and in a very long train in the centres of the last two or three cars next to the last."

[This is the only rational answer that could be given, but how can every passenger be accommodated with a seat in the central car?

American Bells.

Few persons have an idea of the extent to which the manufacture of bells is carried on in the United States. In the foundry of Meneely's Sons, West Troy, N. Y., there have within the last year been cast and sold 500 bells; and the demand therefore is so much on the increase as to compel them considerably to enlarge their works. In almost every part of the civilized world may the chimes of Meneely's bells be heard. Within a short period they have filled orders to China, St. Helena, Cuba, Jamaica, California, and Oregon, besides several to Canada, and almost every State in the Union. They are now making to order a peal of ten bells for a new Episcopal Church in Savannah, Ga., and one of six bells for a church at Troy, N. Y.

Soap Suds as a Fertilizer.

The value of this liquid as a stimulant of vegetation does not appear to be generally appreciated by our agriculturists, many of whom make no use of it. In a state of incipient putridity, soap suds is replete with the element of vegetables, in a state of actual and complete solution; the only condition, indeed, in which it is susceptible of absorption and assimilation by the roots of plants. Besides its value as a powerful stimulant, it possesses, also, very potent anthelmintic properties, and when used in the irrigation of garden and field crops—the best way, perhaps, in which it can be applied to vegetables—operates as a remedy against the ravages of bugs worms, &c. Every farmer should have a large tank or vat, capable of holding from three to four cart-loads, it should be constructed in some place easy of access, and to which, without difficulty, the wash from the sink and laundry can be regularly conveyed. In this reservoir all the wash matter produced on the farm should be thrown—bones, refuse, ashes, muck turf, rich soil, and chip manure from the woodshed; in short, every substance capable of absorbing the rich fertilizing liquid, and retaining it for the benefit of the soil on which it is to be applied. Nature has everywhere supplied in munificent abundance, the means of fertility, and we have only to appropriate and apply them judiciously, to secure the best and most flattering results. Some agricultural writers have estimated the value of a hogshead of suds, in a state of incipient putridity, to be very nearly equal to that of a cord of prepared manure, but as its value depends entirely on the grease or fatty acids, and the soda or potash of which it is composed, non-nitrogenous materials, its virtues may be over-estimated.

Walking Under Water

A Frenchman in Paris, M. de St. Simon Sicard, has recently contrived an apparatus for submarine exploration, apparently very similar in its principal features to the "armor" in common use for this purpose in the United States. It consists of a complete clothing of caoutchouc, including helmet and sack, enveloping the wearer from head to foot, and allowing him to descend below water without danger from contact with anything he may encounter. The helmet has a valve, which permits the air to escape at the moment of submersion; and no sooner is this submersion complete than the pressure of the water closes the valve hermetically. A provision of air to be inspired, is carried in a box, placed like a hump on the back of the diver. This box is furnished with a tube which carries the air into the helmet, in order that the breathing may take place without difficulty and a little stop cock enables the distribution of the air to be regulated at pleasure the instant respiration is performed with effort a signal can be made and the diver brought to the surface.

A Most Singular and Shocking Accident.

On the 2nd inst. a girl by the name of Sarah Hobbs about fourteen years old, at work in the Chelmsford Company's Mills, Dracutt, met with a shocking accident. She was in the act of combing her hair, and throwing it back it caught on a craft revolving over her head and wound her over it till it carried her up against a beam, cutting off both her thumbs, which had become entangled in her hair, and taking the entire scalp from her head—from her forehead back. The scalp was replaced. We learned from Dr. Kimball, who was called to dress the wound, that she cannot recover.—[Lowell Courier.

We shall give an elaborate description of the opening of the Crystal Palace in our next number. The ceremonies came off too late for this week's paper to admit of our publishing a description of the same.

Professor Silliman says, that the aggregate destruction of human life annually, in this country, from the use of fluid and camphene, is greater than by all the accidents with steamboats and railroads.

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[For the Scientific American.]

Storm Indicator.

As something has been said in one or two numbers of the "Scientific American," in relation to "Storm Pointers," (usually called "Storm Glass,") I send you the correct ingredients:—2 drachms of camphor; ½ drachm pure nitrate of potash; ½ drachm muriate of ammonia, and triturate them together until they are thoroughly pulverized; the operation may be assisted by the addition of a few drops of alcohol. When well triturated, the mixture is to be dissolved in about two ounces of proof spirits (good whiskey) and put into a tall vial, such as eau-de-Cologne bottle, or into a glass tube about ten inches in height, and three-fourths of an inch in diameter, the mouth of which is to be covered with a piece of bladder perforated with a pin.

The indications which it gives are of this nature —If the atmosphere be dry and the weather promising to be fine, all the solid part of the composition which appears in the glass will be closely collected at the bottom, and the liquid above will be quite clear; but on the approach of a change to rain, the solid matter will appear gradually to rise, and small crystalline stars will be observed to float about in the liquid, which otherwise will remain pellucid. On the approach of winds, flocks of the composition, apparently in the form of a leaf, will appear on the surface of the liquid, which, in this case, will seem thick and in a state of fermentation. These indications often begin to exhibit themselves twenty-four hours before the actual breaking forth of the storm; and after a short experience in observing the changes of appearance of the materials in the glass, not only the magnitude of the coming storm will readily be estimated but likewise its direction; for the quarter of the compass from which the wind blows will always be indicated by circumstance of the solid particles lying more closely to the side of the glass opposite to that whence the tempest comes. During the winter the composition is rendered white by the multitude of small white stars which are constantly floating about in the liquid: this is particularly remarkable during white frost and snow. In summer, on the contrary, when the weather is warm and serene, the liquid is clear, and the solid matter lies at the bottom of the glass. Some of these indications are as yet unaccounted for; but the leading principle is the solubility of camphor in alcohol and its insolubility in water, combined with the well-known meteorological fact, that the drier the atmosphere the more aqueous vapor does it take up, and vice versa; when, therefore, the weather is warm and dry, a quantity of the water of the menstrum is drawn off in the form of vapor, and consequently more of the camphor enters into solution; and, on the contrary, when the air is surcharged with moisture, that moisture begins to be deposited, and the menstruum again will be weakened, and a quantity of the camphor is precipitated from the solution in the form of little crystalline stars. This may easily be proved by making an alcoholic solution of camphor, and adding a few drops of water. G. M.

Hallowell, Me.

Water through Lead Pipe.

MESSRS. EDITORS—I saw an extract recently, in a paper published in Manchester, N. H., respecting the deleterious effects of water running through lead pipe, upon fish-trout—causing their death. I would state that I have a hydraulic ram—one of J. Ives & Co.'s—which throws water through a 100 feet of lead pipe into a reservoir, which contains about 50 hhds. The reservoir is made by scooping out a hole in the earth in a light sandy soil and plastering with several coatings of hydraulic cement, so as to form a thickness of 1½ inches, which makes an excellent cistern. I put 13 trout into this reservoir last December, and they all lived and were healthy until May last, when I built a small house over the reservoir, and plastered it with lime. When the doors of this house were closed, it was rendered nearly air-tight. I left home for about one week, during which period the reservoir was kept closed, and when I returned my trout were all dead. I attribute their death to the want of proper ventilation—the confined air being affected with the lime, which composed the plaster of the house walls. I have a large trout in a tub at my door—this tub is supplied with water through a lead pipe 50 yards long, and a number of my neighbors are supplied from the same fountain. I am satisfied, that no deletereous effects are produced by the water which runs through our lead pipe. I must say, however, that if the water is left some length of time standing motionless in the pipe it will be somewhat impregnated with the lead. R. P.

Hyde Park, Vt.

[We would state that water, containing some of the lime carbonates, is more safe than pure soft water for family use, if conducted through a lead pipe; the carbonate of lime unites with the lead and soon forms a crust in the inside of the pipe, which prevents the lead from affectingthe water. Water, however, which is conveyed through a lead pipe should never be suffered to stand in it for any length of time; at least we caution every person against the use of such water. When the water which is conveyed through a lead pipe has stood motionless in it for some time, let it all be run off before the water is drawn for domestic use. Some of the physicians in this city (New York) have published statements in our daily papers respecting the injurious effects of Croton water conducted through lead pipes. It is our opinion that if the water used in our city is allowed to flow constantly through a lead pipe, no injurious results need be anticipated.

[For the Scientific American.]

Causes of Earthquakes.

I read in your valuable journal of the 30th April, present volume, a new theory of earthquakes, by a Mr. Drummond, wherein he endeavors to show the agency of electricity in producing them, which brought to my recollection the record of a singular phenomenon, as published in a Connecticut newspaper at the time. Its location was about half a mile above the confluence of the Housatonic and Naugatuck rivers, where the meadows on the west side of the Naugatuck extend quite up to the foot of a bluff, which bounds the meadows on the west; the bluff rises quite abrupt thirty or forty feet to the level land above. Believing it might add somewhat to the plausibility of Mr. Drummond's theory, I have taken the liberty to address this to you with a copy of the newspaper article published at the time. JEREMIAH FRENCH.

Granville, Ohio, June 28th, 1853.

From the Connecticut Gazette, published at Derby, February 18th, 1764:—

"On the evening of the seventh of this instant, February 1764, there was a violent storm of hail and rain; the next morning after there was observed a large breach in a hill on the west side of the old river, supposed to be occasioned by some subterraneous wind or fire; the breach is about twenty feet deep though much caved in; its length one hundred and thirteen feet; about sixty rods of land was covered with gravel and sand cast out of the cavity, some of which was carried two hundred and fifty nine feet to the brink of the river; four trees of about a foot diameter were carried one hundred and seventy-three feet distance, and 'tis supposed by their situation, that they must have been forced up forty feet high; some small stones about the bigness of walnuts, were carried with such force that they stuck fast in a green tree that stood near the cavity; a large dry log better than two feet diameter was carried up so far in the air that by the force of the fall one end of it stuck so fast in the ground that it kept the other end up. The narrowest part of the breech is about thirty feet at the surface of the ground, and the bottom of the breech is crooking, winding much like the streaks of lightning. A light was seen on the spot in the evening before the explosion. It was accompanied by a loud report, and some fossil substances were rejected, which were analyzed by Dr. Munson, of New Haven, and found to contain arsenic and sulphur.

The above account was taken by rule by us, SILAS BALDWIN,
NEHEMIAH FISHER, DAVID WOOSTER.

Cooling Houses.

MESSRS. EDITORS—Let one part of a house be built with a double wall, and let the inner one be, say three or four inches from the outer wall, made of iron, and this space be filled during summer with alternate layers of sand and charcoal; on the top of this let ice be placed every morning, and an arrangement made to cause water to fall slowly on it. In a public house this might be done by the playing of a fountain. The charcoal, acting as a non-conductor, would preserve the coolness long, and provide the adjoining rooms with a comfortable cool temperature. The water, being filtered, would be very pure, and could be used for various purposes. In the winter time the space might be used for hot air. C. M. J.

Philadelphia, Pa.

Ground and Lofty Parachuting.

The Paris correspondent of the Washington Republic gives the following account of a tumble—it could not well be called a descent—in a parachute. They do strange things in Paris:—

M. Letar—a new name in æronautics—announced his ascent underneath the balloon of the Hippodrome, in a machine which he called a navigable parachute. He himself was designated in the bill as the "man that flies." Everything was so pompous and so promising that the Emperor and Empress were unfortunate enough to be taken in by M. Letar, (not into his parachute—Heaven forbid!) but taken in in the sense of befooled. They attended the representation in grand state—After the usual equestrian and military manœuvres, the balloon went up, dragging up a very unwilling looking contrivance, which was the navigable parachute in question. M. Letar was invisible, being completely shrouded in the falling folds of this remarkable invention. He was to be cut down at the height of three thousand feet. I believe that generally when men are cut down it is with an idea of resuscitating them; this time the object seemed to be rather to put him beyond resuscitation altogether. At the height promised the balloon gave out, and a rapid descent was the consequence, the cord was cut at an elevation of two hundred yards, and M. Letar came down, and M. Fontain went up. The navigable parachute, tippped up on one end, refused to open, and thus resist the descent, and, aiming at one end of the Champ de Mars, it swooped down, taking Mons. Letar along with it, in something of the style that would be adopted by a hungry hawk having descried a sparrow on a stone wall. To the spectators the concussion seemed terrific, but the man that flies minded it very little. He was stunned for a moment but actually got up and walked home.

Action of Water upon various Bodies at a High Temperature and under strong Pressure.

The following is an abstract of a paper recently read before the Academy of Sciences, Paris, by A. Reynoso:—

Geology has too often reason to take into consideration the results of the action of water upon substances imbeded at great depths in the earth, to render it necessary here to dwell upon the interest of all investigations o this nature.

M. Alvaro Reynoso places the substances which he desires to study in glass tubes, which are themselves enclosed in gun barrels.

This little apparatus is plunged into an oil bath, which is heated to 536° or 572° Fah., taking the usual precautions against explosion.

Water plays the part of a base in so many cases, that one cannot feel astonished, if, in the experiments that now occupy our attention, in which by the closure of the vessels it becomes actually fixed, it should constitute an energetic base. Thus, for example, M. Reynoso has proved that quinine, which is converted into quinoline by potash under the ordinary pressure, undergoes precisely the same change by the mere action of water at about 482° Fah.

Phosphoric acid possesses the property of three very distinct classes of salts—the metaphosphates, which are monobasic; the pyrophosphates, which are bibasic; and the phosphates, which are tribasic. When a metaphosphate is heated with an excess of potash or soda, the acid is displaced or divided, and converted entirely into ordinary tribasic phosphate. Such is is also the action of water at 536° Fah. In the presence of a monobasic metaphosphate, it intervenes as a base, completing the constitution of an ordinary tribasic phosphate.

The formula PO^5, RO therefore becomes PO^5, 3RO; but instead of a single salt of this form, there are produced thus—

$$6\,(PO^5\,RO) + 12HO = \begin{cases} PO^5, 3RO \\ +3PO^5,\ RO \\ \qquad 2HO \\ +2PO^5, 3HO \end{cases}$$

In two of these salts, the fixed base and the water act the same part, the acid in the one being united to 3 atoms of base, in the other to 3 atoms of water.

It is remarkable, that whilst the substances contain 6 atoms of base, each capable of uniting with 3 atoms of acid, and, as it might be supposed, ready to seize upon it, the mineral base should only take 1 out of 6 atoms of acid leaving two to the water and dividing the other 3 with it. To judge from the result, one might be led to say, that at 536°, Fah., water acts as a base with more energy than the mineral bases themselves.

The pyrophosphates, which are bibasic, undergo an analogous change, that is to say—

$$2\,(PO^5, 2RO) = \begin{cases} PO^5\,3RO \\ +PO^5,\ RO \\ \qquad 2HO \end{cases}$$

The water therefore unites with the mineral base in order to furnish the 6 atoms of base required for the formation of the two new salts.

It is clear that we should change nothing in the general expression of these facts, if we said that the hydrogen of the water acts as a metal, instead of saying that the water acts as base. We shall not therefore stop to dilate upon this point of view.

It must nevertheless be observed, that in such experiments the part played by the water does not always appear so simple; more obscure affinities are sometimes manifested, which give rise to more numerous and complicated bodies. Thus—

Bromide of cyanogen and water furnish hydrobromate of ammonia and carbonic acid; sulphocyanide of potassium gives bicarbonate of potash and hydrosulphate of sulphuret of ammonium; the cyanides of mercury and silver give carbonate of ammonia and reduced metal.

These reactions, which are frequently the last terms of a series of transformations of which the intermediate ones have disappeared, are very simply represented if we no longer regard water as a compound acting *en masse*, but as a source of oxygen and hydrogen, which can present either the one or the other in a nascent state. The formation of carbonic acid and ammonia in the presence of carbon and nitrogen is then no longer astonishing, and may be readily explained and foreseen.

A California Tree for the Worlds Fair.

The following account of a noble tree and its ignoble fate has been transmitted to this part of the Union from California. The tree was discovered about twenty miles from a place called Murphy's Camp:—

"It measures at the ground ninety-eight feet in circumference, and eighty-five ft. at ten ft. from the earth, which size it holds for 100 ft. It is 300 ft. high, though the top has been broken off. There are many trees in this vicinity higher than that, from 50 to 70 ft. in circumference. It is estimated that this tree would square 25 ft. at the butt, and consequently a cut of 12 ft. in length would make ninety thousand feet of lumber. A party of men are now at work in taking off the bark, for 50 ft. in height, in sections, so that it can be put together again. It is about one foot in thickness, and will be sent to the World's Fair, where it will be put up, and have the California specimens exhibited in it. Thirty feet in diameter is quite a room, large enough to hold political mass meetings in, just before a presidential election.

It is estimated by those who have counted the rings, that the tree is not less than 6,500 years old, or five hundred years older than this world, according the vulgar notion.—It must have been something of a tree when Adam and Eve went round to name the productions of the forest."

The beautiful city of Oswego, we regret to state, has been visited with a most destructive fire.

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NEW INVENTIONS.

New Boiler Feeder.

Aaron Arnold, of the city of Troy, N. Y. has invented a new and ingenious steam boiler feeder, for which he has taken measures to secure a patent. The nature of the invention consists in having a small hollow closed metallic vessel, which is hung on a balance outside of the boiler, and has communication at the top with the steam, and at the bottom with the water of the boiler, and is connected with the throttle valve or cock in the feed pipe. The object of this apparatus is to regulate the quantity of water to be supplied to the boiler by a pump, so as to maintain the water in the boiler at a proper level. As the small vessel spoken of communicates with the steam chamber and the water in the boiler, it receives both steam and water, the latter being always at the same level as that of the boiler. It is balanced on a centre in such a manner that when the water in the boiler is at the proper line, it remains poised on its centre, and keeps the throttle valve in the feed pipe open to the exact width that will supply the boiler with water commensurate to the steam used. When the water in the boiler falls below the proper line, the water in the small outside vibrating vessel diminishes, which causes it to rise and open the throttle valve somewhat wider, and letting more water to the boiler. The reverse action takes place when the water in the boiler rises above the proper line. The vibrating outside vessel is guided by the amount of water in the boiler to regulate the throttle valve.

Iron Bolt Machine.

Robert Crichton, of Birmingham, Pa., has taken measures to secure a patent for an improved machine for making metal bolts. There are two new improvements claimed for this machine, viz, the employment and use of holding jaws, so arranged as to hold the bar of which the bolts are made, while the forming laws and heading dies are forming the bolt. It also consists in a peculiar arrangement of the heading dies to form the heads of the bolts. Measures have been taken to secure a patent.

New Fluid Regulator.

An improved regulator for regulating the flow of fluids, and particularly gases, through pipes, passages, or orifices, has been invented by W. Wigston, gas engineer, 79 Merchant's Exchange, this city. The object of the invention is more particularly for the purpose of regulating the supply of gases to a number of burners, supplied by the same pipe, so that the consumption of each one that is lighted shall be at all times uniform, without respect to the number lighted or shut off; by this arrangement no variation is observable in the amount of light given by the several lighted burners, when a number of them are shut off or partly shut off, or when an additional number are lighted. A valve in the supply pipe is so constructed that the flow through a number of smaller pipes passages or orifices shall not be influenced by opening or closing either one of them. Measures have been taken to secure a patent.

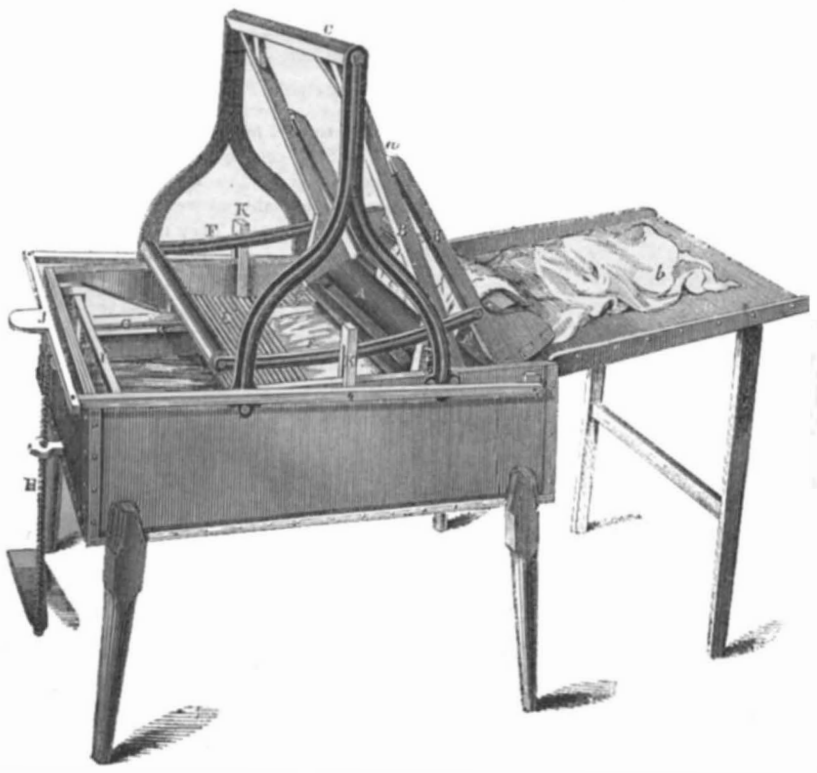
Improved Locomotive Water Tank.

A. W. Leland Rivers, of Charleston, S. C., has taken measures to secure a patent for an improvement in water tanks for locomotives, the nature of which improvement consists in constructing a tank in two halves, or with two separate chambers which are secured together by bolts. Each chamber has a manhole on the bottom, for the hose, and the water can be let out of the one and retained in the other, if desired. The object of the improvement is to allow of one part of the tank being taken off and repaired easily, if injured, without disturbing the other, thus effecting a considerable saving in the course of a year on a railroad.

Machine for Turning Ovals,

An improved machine has been invented by William G. Merrell, of Auburn, N. Y., for turning or cutting ovals, for which he has taken measures to secure a patent. The "trammel" is an instrument well known to all joiners, draughtsmen, and other artisans, and is used by them for drawing ovals. It is merely a plate having two slots crossing each other in it, at right angles. There is a stock having two pins, which fit in the slots in the trammel plate—a pin to each slot—and to the end of the stock is attached a pencil. By turning the stock the pencil will describe the oval. This instrument hitherto has never been successfully used for turning or cutting ovals, in consequence of the difficulty of giving the stock a quick motion, it being necessary that the stock should work steady and firm. The difficulty spoken of, in reference to the stock, is removed by this improvement, by a simple arrangement of cutter stock and a driving pulley.

INDIA RUBBER WASHING MACHINE.---Fig. 1.



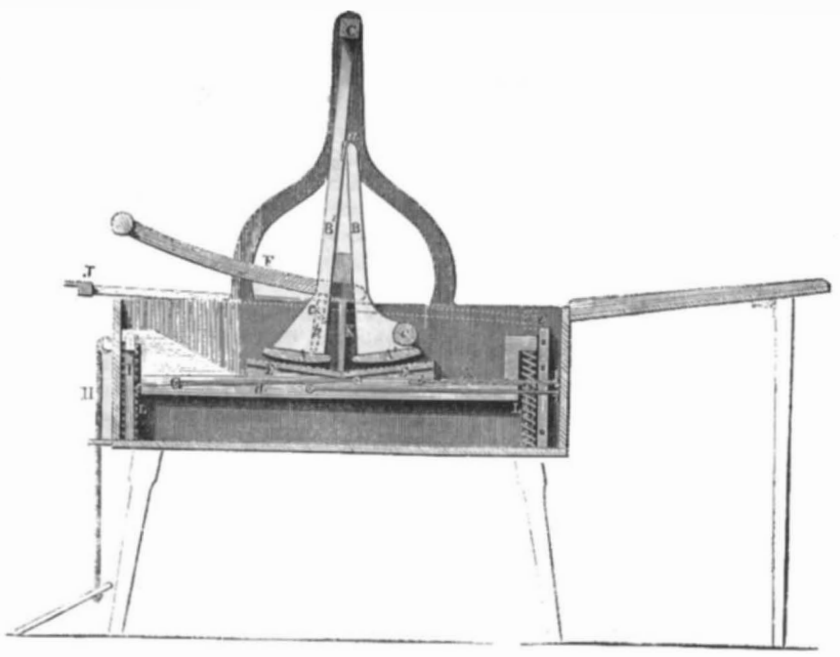
The annexed engravings represent the new Washing Machine of E. L. Evans, who was residing in Hartford, Conn., when the patent was granted to him on the 10th of last May, but who is at present dwelling in this city.

Figure 1 is a perspective view of the machine, and figure 2 is a longitudinal section through the middle of it.

The nature of the invention consists in constructing two rubbers, which are secured on arms suspended from two standards; one of the rubbers is secured to the lower end of one arm, while the other is suspended to a similar arm secured to the main one, by a hinge, which allows the rubbers to be drawn together or forced apart by the operator, at pleasure. The rubbers spoken of, act so as to rub the cloth, to be washed, between them and fluted wash-boards placed under them, one of which is stationary and the other movable—sliding—being moved by a treadle operated by the foot, to draw the cloth through regularly, to present new surfaces to be rubbed. The movable rubbers are of prepared india rubber, and are made to be of a nature like the human hand—something like a cushion, whereby the clothes are well rubbed, with as little injury as possible to their texture.

The machine has a large box with legs on it, a discharge pipe at one end, and a soaping table to prepare the soiled parts of the cloth, *b*, for the

Figure 2.



suds box, there to be rubbed between the rubbers. A A′ are the two india rubber cushion rubbers; they are secured on the suspended arms, B B′; the one, B, is attached to the other by a hinge, at *a*, to allow the two rubbers to open, to let the cloth pass through between them to be rubbed. The arms swing on an axis pin, C, secured to the upright standards of the box. E E′ are the two fluted wash-boards under the rubbers, A′ A; these boards are always close together when the operator is pushing the rubbers back and forth by the handle, F, and kept so by pressing with his foot on the stirrup, which draws down the cord, H, and draws forward the board, E, it being attached by brass rods, G, to the cross-bar, I, at one end, and at the other by india rubber spring cords, X, secured to the back of the box. When the foot relieves the stirrup, the spring cords, X, draw apart the board, E, and this leaves a space between the boards to let the rubbed clothes drop down into the suds box. To do this, and take a new surface to be rubbed, the rubbers, A A′, which are like jaws, have to be thrown apart—opened; this is done by slightly raising the handle, F, as there is a shipper attached to the arm, B, shown by dotted lines, *c*′, fig. 2, which works in a guide angle slot, *b* (fig. 2), thus opening the space between the rubbers, to take in a new surface of cloth over the small roller, *c*, and feed it in towards the centre, to be rubbed between the boards with the rubbers. The rubbers are closed by bringing the arm, F, to a horizontal line.

The fluted wash-boards can be elevated or lowered, so as to bring them very near to, or a greater distance apart from the rubbers, and thus enable the operator to wash a piece of lace or a quilt in the same machine. The boards E E′, rest on two side stretchers, *d d*, which rest on a coiled spring, L L, at each corner of the tub. J is the cross handle of a side lever (one on each side) secured on a fulcrum pin, *e*, at one end, and attached to vertical sliding blocks, K K—one on each side—which rest on the stretchers, *d d*, that support the wash-board. By pressing on J with the hand, the operator depresses the wash-boards, E E′, and graduates the distance between them and the rubbers, A A′, with the utmost nicety, to wash any article—the most delicate or coarse. The action of this machine is like that of rubbing clothes between the hands—the best principle yet known; and it is the best washer that has ever been brought to our notice. With the hand the operator merely pushes the handle, F, back and forth, to rub the clothes, and as the rubbers are poised on a centre, this work is light and easy; with the hand and foot the clothes are rubbed, and the rubbers and boards thrust apart and brought together so as to feed in new surfaces, and deliver the cleaned clothes with great facility. The soap board is for the purpose of rubbing the soap on the clothes—the most soiled parts, previous to their being placed in the suds at the right-hand end of the box, from which they are fed in over a roller *c*, between the rubbers, A A′, down between the boards, E E′, and delivered after rubbing down into the box and taken out, when finished, at the left-hand side. This washing machine is certainly novel and worthy of great favor by all good housewives

One of these machines will be exhibited at the Crystal Palace, and the patentee can be addressed by letter at No. 551 Sixth Avenue, this city, (New York.) The machines are manufactured in Newark, at prices varying for $12 to $16 and upwards.

Improved Life-Preserving Apparatus.

An improvement in apparatus for preserving life in case of shipwreck or other similar contingency, has been made by W. R. Phipps, of Framingham, Mass. The object of the invention consists in attaching propellers or paddles to the feet of persons thrown into the water, to be used in connection with the usual life-preserving apparatus around the body; the paddle is so constructed that when the foot of the person is moved forward, it does not act upon the water, but when moved in the contrary direction, it falls down at right angles to the bottom of the foot, and acts upon the water like a paddle. It is hung by a hinge to the foot plate, and serves to balance the body when in the water, as well as to assist in moving it in any desired direction. By means of this apparatus and the common life preserver, a person may walk quite rapidly in water without inconvenience or danger. Measures have been taken to secure a patent.

Assistant Editor Wanted.

Owing to an increased amount of labor consequent upon the opening of the Crystal Palace, we require an Assistant Editor on this paper;—a man well acquainted with the arts, sciences, and mechanics, having *practical* knowledge of, and a taste for machinery, can make a permanent engagement. We prefer one who can translate French, bnt the want of this accomplishment is not an insuperable objection. Address the publishers immediately, stating where an interview can be had and upon what terms an engagement can be made. None but a competent person need apply.

Atlantic Races.

The Arabia, on her last passage to Liverpool, made the run in 9 days, 17 hours, 11 minutes, the fastest passage ever made, by 15 minutes. Well, the trial of speed is coming pretty close when the difference is measured by minutes, the way we would measure a race to Albany.

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Scientific American

NEW-YORK, JULY 16, 1853.

Gold Machinery.

The discovery of our Continent by Columbus, rousing, as it did, the nations of the old world to a most extraordinary state of activity, perhaps produced no more wonderful results than the discovery of gold in the sands of California in 1849. As in the former case, fleet after fleet of adventurous spirits left the shores of Europe in search of the El Dorado, so in the latter case, fleet after fleet, with daring and enterprising men, left our shores, and those also of the old world, in search of the more modern "Golden Land," on the shores of the Pacific.

An impulse given to many minds in one direction, re-acts upon other minds in a different direction; thus shortly after the discovery of America, there arose a splendid dynasty of philosophers, from Gallileo downwards, and an impetus was given to every department of mechanics, which has never flagged from that day to this. In our own times, also, those who have watched the course of events—readers of the signs of the times—have not failed to perceive the wonderful *vaultings*, as it were, of mind in invention and discovery since the golden nuggets of California and Australia began to lure forth so many thousands from their old homes and habits, to new scenes and new occupations. To meet new commercial wants, a complete revolution is being effected in naval architecture; and to meet the wants of the toilers amid the gulches and ravines of the golden country, thousands have directed their attention to invent new machinery whereby the "noble metal" might be rapidly and economically separated from its earthy companionship. No one living out of New York City can form a proper idea respecting the number and variety of machines which have been exhibited in our streets to the thousands who have come here from different parts of our country on their way to California. We have taken no public notice of the great mass of these machines, because they did not appear to be worthy of criticism or commendation. Hundreds of such machines, as told to us, have been sold to credulous gold-seekers, only to be thrown away or trampled under foot when they arrived at their destination. Some machines, possessing much originality and merit, we have illustrated and spoken of as they deserved, such as Cochrane's excellent Planetary Crusher, Gardiner's Magnetic Extractor, Buffum's Centrifugal Separator, and Berdan's Inclined Grinder and Amalgamator, which was represented on page 65, this Volume. After eight years of experience in such matters, as public journalists, our readers know full well that we are somewhat cautious, and not over-prolific of praise, even in the most deserving cases, while on the other hand, we are not very fastidious nor backward in speaking freely of miserable and deceptive schemes, when convinced that we owe it as a duty to the public to do so.

Within the past two years more attention has been devoted to the invention of good crushers and amalgamators than to mere gold washing machines, and the reason is obvious. The auriferous sands of California and other golden lands, will soon cease to yield their treasures, but not so the golden quartz rocks. With proper machinery they will produce for centuries to come unlimited quantities of gold. The business of obtaining gold from such sources, will, in a few years, be in the hands of those who have capital, to purchase and use improved machinery, and those who use the best will certainly make the largest profits. Since we published the illustrated description of the last-named machine (Berdan's), and especially since we noticed one of its public exhibitions on page 258, we have paid further attention to its workings and have closely investigated the principle of its action, and we have no hesitation in pronouncing it without a superior as a quartz crusher and as an amalgamator (it combines both qualities), it is the best we have seen. It amalgamates so perfectly that different chemists, by a careful analysis of the tailings or refuse, have failed to detect the slightest particle of gold. This certainly is a very emphatic recommendation of the qualities of this machine.

We visited the Novelty Works last week and saw a large number of workmen busily employed in constructing these machines for California, North Carolina, and other gold mining districts, and we understand that more than two hundred have been made and disposed of already. The reason why it operates so rapidly and perfectly is owing to the nature of its action and operation; which need not now be described, as we fully illustrated the machine on page 65 of the present volume; suffice it to say, that new surfaces of gold and mercury are continually brought into contact by the ball and basin moving in contrary directions.

Having been informed that there are some large companies now forming in England for working the gold quartz of Australia, and having seen in the "London Mining Journal" an account of one company in London, which had expended a great amount of money on machinery to work the gold quartz of California, from which they had never received, in return, a single dollar, although men and machinery were sent to San Francisco more than two years ago,—we deem it our duty, at this time, to direct the attention of our transatlantic brethren to the merits of this superior American machine. We also do so, especially, as a matter of duty to our readers in Britain—having not a few in that country; we speak to them in confidence of what we have seen for ourselves.

Steamboat Accidents—The New Law.

A very stringent law for the prevention of accidents in vessels navigated in whole or in part by steam, went into operation on the 1st of last January. When commenting on the benefits likely to be derived from said law, we stated that "everything depended on the capacity and faithfulness of the inspectors appointed under its provisions." Accidents have not ceased since it went into operation; on the contrary a great number have taken place. This calls for increased vigilence and care on the part of those appointed by government to carry out and enforce the law's requirements. On the 1st of this month, the splendid steamboat New World, running on the North River, burst one of her flues, by which no less than seven persons lost their lives. The engineer was one of the most experienced and cautious men in our country; recklessness was not a part of his character. His word with the owners was law; if he said that any part was defective, it was at once repaired. We hope the Chief Inspector for this district will see to it that the new steamboat law is rigidly enforced; this never will be done if he trusts wholly to the men whom he appoints under him, however respectable they may be. We are not positive but from a partial personal observation we are led to believe that the law is not strictly enforced on the steamboats in this district, so far as it relates to the supply of lilfe boats, life preservers, &c. There is perhaps more danger of life on the ferry boats plying between New York City and her suburb cities around, than on any steamboats in the world, and yet so well have these boats been managed that very few accidents have taken place. We speak of *the danger* as it exists in proportion to the number of passengers carried, and the number of boats and vessels crossing the track of one another every day and night. Every ferry boat should be fully provided with life preservers, because the decks are oftentimes so loaded that life boats would be of little avail.

Postage Money Letters.

Although our Post Office system is much superior to what it was a few years ago, it is by no means perfect, nay, it is not at all to be compared with the post office system of some other countries. Thus, for example, although the Post Office is entrusted to carry letters, papers, and books, it is not trusted with the carriage of money letters, specificially as such. This is the reason why private agents—express companies—are highly paid for carrying packages containing money between different cities. It would be a great convenience and benefit if our post office system was so amended as to provide for the transport of money, at least in small quantities, by giving certificates and duplicates of deposit to the senders, which certificates sent in letters would entitle the receivers in any distant place to draw the amounts deposited from the Post Office there. To people in moderate or poor circumstances, but who have occasion sometimes to send money to friends, or for other honest purposes, this means of sending it would be a great convenience, and tend greatly to elevate the character of the Post Office in the estimation of our people. This system is pursued in the British Post Office; any amount of money can be sent by a Post Office certificate, from one part of that country to another. This system should be extended to nations, but *we* must first carry it out in our country. Why should it be said that we are behind any monarchial country in any system which relates to the benefit of the people. We should be the first of nations in every improvement, governmental and municipal, and we ought to take shame to ourselves in being regards in postal improvements. We hope that Congress at the next session will seen end the Post Office Law as to provide for the carriage of money by certificate, charging a certain amount for the extra trouble given to the Post Office.

Coloring Ivory.

We have received a communication from a correspondent asking for information respecting dyeing and staining ivory various colors. For himself, the correspondent states, "the information will be very useful, and no doubt it will be as much so to many others."

RED.—Ivory can be colored a beautiful red with cochineal. The way to do this is, first, to clean the ivory article well with a strong solution of soap and then rinse it in water, so as to remove all grease from the surface. Have a clean copper or other vessel (but not iron) boiling with some ground cochineal (enough to color the water a deep red) then add about as much cream of tartar as cochineal and some alum—chloride of tin is better than alum, however—and then boil the ivory in this for a few minutes, then take it out and dip it in cold water; return it again for a few minutes longer to the boiling cochineal, then take it out and wash it in clean water, when it will be found to be a beautiful red color. The ivory articles may require a few dips back and forth from the cold water to the boiling cochineal, but with care the process will dye ivory a fine red color, better than any other known to us. The cream of tartar must be carefully used or it will injure the surface of the ivory.

BLACK.—Ivory can be colored a beautiful black by boiling it in a strong solution of logwood, some walnut bark, and copperas.—This color is easily dyed, and if the ivory articles are greased with a little lard, after being colored they will look much better.—Black is a color for which grease and oils are much used to give it depth and beauty. Cotton, worsted, silk, and other fabrics dyed black are much improved by a liberal supply of olive oil. Black leather is also improved in appearance by it. By staining ivory in spots or streaks, with a strong solution of the sulphate of iron, then drying it, and afterwards boiling it in a strong solution of logwood, the ivory will be colored in light and dark streaks or spots. For all colors except black, the articles of ivory to be dyed should be washed well so as to remove all grease from their surface.

PURPLE.—This color can be produced on ivory by boiling the article or articles in a solution of logwood, a few drops of the chloride of tin and some cream of tartar. Alum will answer in place of the tin liquor, but it will not make such a beautiful color. Ivory should be boiled but a short period at once for any color, and should receive a number of dips as described for the red.

YELLOW.—Some turmeric and alum boiled together will dye a good yellow; but it easily fades in the sun. Fustic and alum makes a more permanent but a less brilliant color. Quercitron bark and the chloride of tin will also dye a yellow.

GREEN—May be colored with the sulphate of indigo and fustic.

BLUE—May be dyed with the sulphate of indigo alone; if first boiled in a weak solution of the nitrate of iron, then washed, and afterwards boiled in a solution of the prussiate of potash made slightly sour with sulphuric acid, a more beautiful blue will be produced. This color will be rendered very deep and dark if some logwood liquor is added along with a few drops of the chloride of tin. The logwood liquor is obtained by boiling some logwood chips for an hour, and then throwing away the chips. All the drugs and dyestuffs mentioned can be obtained at any respectable druggists store. The amount of each stuff to produce the colors is not specified, nor is there any necessity for so doing. Let the color of the boiling liquid in the vessel guide the person who wishes to dye his ivory, before he puts in his articles, as to the depth of shade he desires to produce, and he will not go far wrong. Care and attention with what we have said, will enable any person to color ivory.

Events of the Week.

MECHANICS' EXCURSION.—On Saturday, the 2nd inst., the machinists, engineers, and operatives, numbering about 500, in the employ of Messrs. Danforth, Cooke & Co., Locomotive and Cotton Machinery Manufacturers, of Paterson, N. J., visited Jersey City, by railroad, on a pleasure excursion. They made a most favorable impression upon all who saw them, by the respectability of their appearance. The works of Messrs. Danforth, Cooke & Co., are very extensive, and the firm has long been distinguished for its manufacture of good cotton machinery. Last year the manufacture of locomotives was commenced, and since that time a number of engines have been built, and the occasion of the excursion was the completion of a new first-class locomotive, named Governor Williamson. The mechanics, along with them some of the employers, arrived in Jersey City a little after 12 M, and formed a line of process in with music playing and banners flying, through several of the streets, and afterwards sat down to a fine repast in one of the hotels, where they had a pleasant and happy time of it lot a few hours. A good understanding between employers and their men is a benefit to both Mr. Danforth gave an appropriate sentiment at the dinner, which is worth some circulation, it was—"Good workmanship and good wages."

PARKER'S WATER WHEEL.—We have received a communication from O. H. P. Parker, brother of the inventor of the wheel known by the name of "Parker's Water Wheel," in answer to the article of J. B. Conger, which was published on page 235, this volume, Scientific American. In that article it is stated that Fourneyron, in France, gave the inlet water to a wheel a whirling motion, before Mr. Parker. This is denied in the letter we have received, and other statements in the said article of Mr. Conger are stated to have done injustice to Parker's claims. Having received a great number of communications on the Parker Water Wheel we have determined to publish none of them, as they are mostly of a controversial character. Mr. Parker has done much to improve reaction water wheels; in fact, we believe that our country is more indebted to him than any other man for the high perfection which has been attained in America, in reaction hydraulic motors. He should have met with an ample reward, but like too many other worthy inventors, did not.

ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.—On Thursday, the 28th inst., two weeks from Thursday next, the American Association for the Advancement of Science, will commence its annual session at Cleveland, Ohio. This valuable society has had no meeting since the annual session held at Albany in 1851, the session of 1852 having been put off in consequence of the prevalence of cholera along various travelling routes in different parts of the country, and the apprehensions entertained respecting the epidemic. During its brief existence, this Society has attained considerable importance in the eyes of the general public. The meeting of the present year will be the first held west of the Alleghenies, and will, it is said, be attended by many professors and others from that region. The members will no doubt be hospitably entertained by the people of Cleveland, a place celebrated for its beauty, hospitality, and enterprize.

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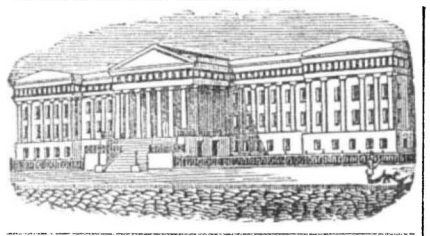

Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING JULY 5, 1853

INSTRUMENT FOR CORRECTING LATERAL DEVIATIONS OF THE SPINE—By Alanson Abbe, of Boston, Mass.: I claim the instrument, as made, of a combination of the crutch, the hip plates, the plates, the wedges and screws thereof, the breast or body band, and its pads, and straps or other contrivances for confining the whole instrument to the thigh and body, the whole being applied together and made to operate as specified.

CLAVICLE ADJUSTERS—By A. M. Day, of Bennington, Vt.: I claim the arms of the yoke, hollowed as described, in combination with the straps and attached and operating as described, by means of which the acromion process of the scapula is compressed, and the arm held in position, for uniting a fracture of the clavicle, as specified.

CRADLE AND TETE-A TETE—By Geo. H. Hazlewood, of Boston, Mass.: I claim constructing the two sides of the bed frame of the cradle, that portions of each may be turned around and arranged parallel to one another and across the bed frame so as to convert such bed frame into a tete-a-tete seat or chair, as specified.

CANNON AND OTHER FIRE-ARMS—By C. W. Lancaster, of New Bond street, Eng. Patented in England Jan. 16, 1851: I claim, first, the method of boring the barral of a gun or other fire-arm, so that a cross section thereof would be in the form either of an ellipse or of a series of curves, by the mechanism as described, or its substantial equivalent, as set forth, whereby the injurious action of the angular groove in ordinary rifles, is obviated, while all its advantages are retained.

Secondly, I claim the construction of the boring tool for giving to the bore a form of which the cross section is not a true circle, that is to say, I claim the combination of the cutter bar with the boring tube, the said bar passing through said tube eccentrically, the axes of both being parallel, whereby the elliptical or other shaped bore, is given as described; also the bar and its inclined plane in combination with the cutter for regulating the depth of the cut, as described; also the expanding collar, the inclined or bevelled space, on the boring tube, with the other parts in connection therewith, as described, for the purpose of guiding the boring-tool when boring out an irregularly formed cylinder, as described.

Third, I claim the curved rail, or other like fixture for giving the proper motion to the barrel of the gun during the boring operation, by which the spiral or twist is given, as described.

Fourth, I claim the cap for supporting the boring tube just at the moment the cutter is about to clear the muzzle, as set forth.

PROPELLING VESSELS—By T. L. Mitchell, of Birkenhead, Eng. Patented in England Nov. 25, 1848: I claim constructing the blade or blades of the same upon the principle or in the form of the "bommareng" as described.

TRUSSES—By John North, of Middletown, Conn: I claim as my improvement in trusses and supporters, the mode set forth of adjusting the pressure of the pad, that is to say, by the employment of the right and left screw, and the adjusting nut in combination with the pad lever in the manner set forth.

LANTERNS—By Wm. Porter & E. A. Tuttle, of Williamsburgh, N. Y.: We claim the small rods extending from the lower part or cup of the lantern to the top or cap, and uniting them both together by a catch, thereby securing the globe between them in the manner set forth.

PADDLES FOR VESSELS—By Amzi C. Semple, of Cincinnati, Ohio: I claim the use of vulcanized india rubber or other similarly elastic substance which will produce the intended effect in the construction of floats of paddle wheels for the purpose described.

CROW KILLERS—By N. J. Tilghman, of Salisbury, MD.: I claim the combination of the dart, helical spring sliding rest, or head, attached to the triggers and the dog, with the hollow post in which it is placed.

IMPROVEMENT IN BRUSHES—By J. Cross, of New London, Ohio: I claim a brush consisting of a divided case to hold the handle and bristles, constructed and arranged as described, in combination with a wedge forced among the ends of the bristles within the case and tightened from time to time, so as to squeeze and hold them, by screwing the two parts of the case together, as specified.

RE-ISSUE.

PROCESS OF FLOURING—By D. P. Bonnell, of Tecumseh, Mich. Patented originally Aug 14, 1849: I claim the process of grinding the offal of grain, immediately after it has passed from the bolts, contemporaneous with the first flouring, and by the continuous operation of the machinery adapted to said process, as set forth, for the purpose of increasing the quantity and improving the quality of the superfine, or other flour.

DESIGN.

WAFFLE BAKER—By Nathl. Waterman, of Boston, Mass.

Railroad Accidents in Massachusetts.

During the seven years ending 1852, fifty-five million, three hundred and fifty-seven thousand, four hundred and fifteen (55,357,415) passengers were carried over the railroads in Massachusetts.

Forty-two passengers were killed—twenty of the number in consequence of their own heedlessness, in attempting to get upon or jump from the trains while in motion, or standing on the platform of the cars, contrary to the published and well known rules of the different roads.

One hundred and fourteen (114) were killed while walking or sleeping on the tracks of the roads. Of these several were deaf and dumb, and some are reported to have been partially blind.

In one year, seven persons were killed while walking or sleeping on the track of the Boston and Providence Railroad, and during that year no accident of any other kind occurred.

One hundred and twenty, (120) employees were killed, thirty-two of the number by being brought in contact with bridges. Two were killed in consequence of the explosion of boilers.

In the year 1852, three thousand, nine hundred and ninety-two men were employed in working the railroads of the State, exclusive of those engaged in construction.

Means of Detecting the kind of Dyes used in the Coloring of Textile Fabrics.

It is not unfrequently desirable to know, with regard to dyed stuff, in what manner it has been dyed, and what dyeing material has been employed. This cannot always be decided by the appearance; for example, in the case of a dark blue, the question rises whether the ground is pure indigo or pure logwood, or a mixture of both, or whether prussian potash-blue is not present, &c. For this purpose recourse must be had to chemical reagents.

In order to ascertain what mordants have been used, the most accurate method is to incinerate a sufficiently large piece of the stuff, and examine the ash.

BLUE COLORS.—These may consist of indigo, logwood, prussian blue or ultramarine.

Indigo blue is fixed on cloth in various ways,—1st, in the blue vat; 2nd, as so-called China or English blue, blue patterns upon a white ground, fixed, according to the principle of the blue vat, with lime and sulphate of iron; 3rd, as pencil-blue, the indigo being deoxidized by means of oxide of tin and potash; and 4th, as soluble indigo.

The first three blues are not acted upon by dilute acids or alkalies. By chlorine and nitric acid, on the contrary, they are destroyed. When the stuffs decolorized by chlorine are washed and dipped in a solution of logwood, the first two remain colorless because they contain no mordant, while the stuff dyed with pencil-blue becomes red on account of the tin which it contains.

The blue of soluble indigo, and that obtained with cyanide of potassium, agree in being destroyed by alkalies; at the same time, however, the blue of indigo leaves a white ground, while that of the cyanide leaves a rusty yellow ground on account of the iron mordant employed. In order to remove all doubt, a few drops of acidulated solution of cyanide of potassium should be added, which, if iron is present, reproduces the blue color. This confirmatory test should always be used in the case of green colors.

Prussian blue may be recognized by its being decolorized by alkalies, but not by chloride of lime, while the latter re-agent destroys indigo-blue. The appearance alone is sufficient to indicate whether the blue is ordinary prussian blue or "bleu de France," prepared with stannate of potash.

Logwood blue may easily be recognized from the fact that it is destroyed by weak acids, and becomes red; in most cases this is a sufficient ground for interring the presence of logwood, &c.

When the color to be examined is a mixed one, for example, logwood-blue, with prussian blue or indigo, the color of the logwood is first destroyed by dilute acid, the stuff washed and treated with chlorine to ascertain whether the ground color is indigo or prussian blue.

Ultramarine may usually be recognized by its peculiar tint; after incinerating the stuff it remains unaltered in the ash. Hydrochloric acid decomposes it, disengaging at the same time an unpleasant odor of sulphuretted hydrogen. When the ultramarine is imprinted with varnish, the stuff must be moistened with ether before the hydrochloric acid will act.

RED COLORS.—With the exception of safflower, the red coloring matters require a preparation of alumina or tin.

Safflower may be easily recognized by its color being discharged by caustic potash or soda. Madder colors when treated with hydrochloric acid, acquire a yellow or orange tint without any shade of puce; upon then being treated with milk of lime, the color becomes violet at those places where the hydrochloric acid has acted. The violet is permanent, and by boiling with soap, passes into rose color.

The madder-red colors are less susceptible of alteration by acids the more they have been brightened by soap and the higher the temperature at which this took place. The great durability of the Turkish red is owing to this fact.

The red and rose colors from madder are separable into several kinds—Turkish-red and rose, ordinary madder-red and rose, the true topical red, and the colors from garancine and garanceaux.

Turkish red may be known by its brightness and indestructibility by acids. Ordinary madder red, when brightened, scarcely differs in any particular, from a true topical color. The only difference is in the mode of preparation. As the topical color is prepared before printing with tin, and after printing the stuff is steamed, the white is somewhat yellowish, and becomes colored in a decoction of logwood. The red and rose from garancine and garanceaux differ from the above colors in not bearing brightening with soap, acids, and alkalies. When treated with hydrochloric acid, they pass into orange, and do not then give a violet, but a dull blue color, with milk of lime.

The tone of color is sufficient to distinguish between colors produced from garancine or garanceaux, the latter possessing an orange shade. When the red is accompanied by violet, the distinction is still more easy, because garancine yields a violet, which is nearly as beautiful as that from madder, while the violet of garanceaux is more reddish-gray.

The red colors from Brazil-wood and cochineal, when treated with hydrochloric acid and tin salt, become gooseberry red; and then milk of lime produces a violet of little permanence, which disappears entirely on subsequent boiling with soap, while the madder colors acquire their greatest brilliancy by this treatment.

The red from cochineal differs from that of Brazil-wood in tone and in its behavior with concentrated sulphuric acid; the former becomes bright-cherry-red, the latter orange.

YELLOW COLORS.—The yellow of quercitron is discharged by chlorine and sulphurous acid, and it is not sensibly changed to orange by either caustic potash or tin salt.

The yellow of buckthorn-berries is likewise destroyed by chlorine; caustic potash renders it bright yellow. Heated with tin salt, it passes into orange; with sulphuric acid it acquires a stone color.

The orange and nankeen colors from fustic and fustet are changed to red by sulphuric acid; treated with potash they acquire a color resembling that of catechu; they are discharged by nitric acid.

The yellow from sumach acquires greater brightness with tin salt; with nitric acid, it becomes red; sulphuric acid does not produce much alteration; sulphate of iron changes it to gray.

The yellow from arnotto is but little affected by chlorine; concentrated sulphuric acid changes it to bluish-green; with nitric acid it assumes a darker color, and then disappears entirely.

Chrome-yellow is unaltered by heating with weak hydrochloric acid, but destroyed by the concentrated acid. It is destroyed by caustic alkalies; boiling potash converts it into orange. Chrome-orange becomes greenish yellow when treated with weak acids.

BLACK COLORS.—Log-wood black contains iron as a mordant, sometimes iron and alumina. In the latter case it has a shade of blue. Such a color is discharged by chlorine, a yellow resulting from the iron ground remaining. Treated with hydrochloric acid and tin salt, it becomes red, with the former more cherry-red, with the latter violet-red.

The blacks from astringent substances are easily recognizable by the shade of olive which they present. When treated with hydrochloric acid, they acquire a dull orange color; tin salt dissolves the iron, and changes the color to a dirty olive.

Chrome black may be known by its behavior with chloride of lime, which destroys the other kinds of black while it changes chrome black to a chestnut-brown.

The examination of mixed colors is somewhat more complicated; but as they are for the most part constituted of the substances already mentioned, it will not be difficult, by means of the above re-actions, to ascertain in what manner and with what materials such colors have been produced.

Oaths Required for Caveats.

It is hereby ordered that hereafter no Caveat be placed in the Secret Archives of this Office, unless accompanied by an oath of citizenship and originality of invention.

CHAS. MASON, Commissioner.

Patent Office, July 6, 1853.

[Inventors will perceive that the above is a new course of action adopted by the present Commissioner of Patents. This policy will, no doubt, meet with the approval of all honest inventors; we approve of it as a just and right measure.

Engineer Appointment.

It is reported that Charles W. Copeland, P. E., of this city, will be appointed Chief Engineer U. S. N. A more competent engineer could not be selected for this high and exceedingly important office.

J. Bolayer, Washington, D. C., wishes to ascertain, if possible, who sells James Buffington's machines for cutting sausage meat: patented July, 1833.

TO CORRESPONDENTS.

N. S., of Mass.—We understood you to mean, by the double bearing in axles, "the axle divided and having two side and two central bearings, like the one patented by R. Stephenso." The double bearings on each side have been in use a considerable time. If the generator was merely claimed for saving the excess of heat not used, we should not have found any fault. We shall endeavor to give you the other information soon.

G. F. W., of R. I.—If you will refer to the Sci Am. No 34, you will find a description of Gardner's axle, which embraces the same contrivance as yours.

H R., of Ill.—There is nothing new in your coupling for cars; the invention is old and well

O C., of Ohio—We advise you not to expend money upon your Safety R R. Track; it is probably patentable, but we think you could not get it introduced; several plans equall as good have been proposed to effect the same object, none of which have been adopted.

B. S., of Conn.—We cannot tell the power of your wheel, but if you multiply the quantity in pounds discharged per minute, by the perpendicular height and divide that by 33,000, you will obtain the horse power of the water: one wheel will give as much as 20 per cent. more than another.

F. W. G., of Conn.—We could not tell you the size of bar, for we have never used an electro-magnet capable of raising 3000 lbs. More depends on the manner in which the magnet is made, than the size of the bar: the finer the wire the better the magnet; it will take about 40 cups of a Groves' battery to work the force you require.

L. F. H., of Vt.—Your method of hanging a saw without a sash is entirely different from that described in the Sci. Am. to which you refer; we have never seen an arrangement of the kind you speak of; we see no reason why you are not entitled to a patent.

W R. H., of Wis.—Heat oil to as high a degree of heat as possible without setting it on fire, dip in your steel squares for a few minutes, then take them out and dip them in cold water; in this way you will be able to temper them.

A. A. H., of N. Y.—Your arrangement for a clamp has been used quite frequently for other purposes than the one for which you employ it; its application for that purpose does not produce a result that would entitle you to letters patent; you had better not make the application.

S. W., of Pa.—No circular railway would be allowed in a Park in this city; a ton weight cannot propel more than a ton weight, and it would all depend on the height the weight had to fall, for velocity; bodies fall at the rate of 16 feet during the first second; you could not operate your car on a level by the weight of the passengers

G. B., Jr., of Md.—We are afraid you cannot obtain a patent for your composition, as nearly all the substances employed by you have been used by others; when you come here we will talk over the matter.

Money received on account of Patent Office business for the week ending Saturday, July 9:—

W. F. T., of N. Y., $25; J. McC., of N. Y., $20; P. E. B., of Me., $55; W. G., Jr., of Ohio. $30; L. B. A., of Pa., $25; C. D, of Ill., $10; D. B. M., of N. Y., $30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday July 9:—

C. D., of Ill.; D. H., of Ky.; L. B. A., of Pa; B. F. H, of Ill.; W. F. T., of N. Y.: J. McC., of N. Y.

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Maryland Silver.

The "Liberty (Md.) News" states that quite a quantity of silver ore is found mixed with the recent raising of copper at the Dollyhide Copper Mine, in Frederick Co. In value it bears the proportion of about fifty dollars to the ton; equal to an addition of nearly twenty per cent. It is thought the vein will continue to yield it for a long while. Isaac Tyson, Esq., President of the Company, has leased the copper mines near to New London, upon the lands of Wm. Hobbs, Esq, to a New York Company, by whom they are now being worked.

A severe storm occurred in Rockland Co., in the nighborhood of Haverstraw, on the 9th inst. Trees and houses were blown down, and by the fall of one house, five persons were killed. More destruction of life and property has taken place around New York, by sudden severe storms this season than any within our recollection.

A Chapter of Suggestions, &c.

PATENTEES—Remember we are always willing to execute and publish engravings of your inventions, provided they are on interesting subjects, and have never appeared in any other publication. No engravings are inserted in our columns that have appeared in any other journal in this country, and we must be permitted to have the engraving executed to suit our own columns in size and style. Barely the expense of the engraving is charged by us, and the wood-cuts may be claimed by the inventor, and subsequently used to advantage in other journals.

GIVE INTELLIGIBLE DIRECTIONS—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure, but no name of State given, and often with the name of the post office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the post office at which they wish to receive their paper, and the State in which the post office is located.

BACK NUMBERS AND VOLUMES—In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement:—Of Volumes 1, 2 3 and 4—none. Of Vol. 5, all but six numbers price, in sheets, $1; bound, $1 75. Of Volume 6 all; price in sheets, $2; bound, $2,75. Of Vol. 7 all; price in sheets. $2; bound, $2,75. Of Vol. 8, all the back numbers subsequent to No. 27, but

PATENT CLAIMS—Persons desiring the claims of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office—stating the name of the patentee, and enclosing one dollar as fee for copying.

PATENT LAWS, AND GUIDE TO INVENTORS.—We publish, and have for sale, the Patent Laws of the United States. The pamphlet contains not only the laws but all information touching the rules and regulation of the Patent Office. Price 12 1-2 cts per copy

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☞ All advertisements must be paid for before inserting.

Foreign and American Patent Agency

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon the most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents

MUNN & CO., Scientific American Office,
128 Fulton street, New York

LAWRENCE SCIENTIFIC SCHOOL, Harvard University, Cambridge, Mass. The next term of this institution will open on the first day of Sept, 1853, and continue 20 weeks. Instruction by recitations, lectures and practical exercises, according to the nature of the study, will be given in Astronomy, by Messrs Bond; Botany, by Prof Gray; Chemistry, Analytical and Practical, by Prof. Horsford; Comparative Anatomy and Physiology, by Prof Wyman, Engineering, by Prof. Eustis; Mathematics, by Prof Pierce; Mineralogy, by Prof. Cooke; Physics, by Prof. Lovering; Zoology and Geology, by Prof. Agassiz. For further information concerning the School, application may be made to Prof. E. N. Horsford, Dean of the Faculty.
Cambridge, Mass., July 15, 1853. 44 8*

SIXTH ANNUAL EXHIBITION OF THE MARYLAND INSTITUTE, will open at the unrivalled Hall of the Institute, in the city of Baltimore, on Monday the 3rd day of October, 1853, where articles for competition and premium will be received from Monday, 26th, to Thursday 29th of September, inclusive; after which deposits will be entered for exhibition only. To this Exhibition the artists, inventors, manufacturers, &c., of the entire union, are cordially invited to contribute. The central location of Baltimore, and the high reputation of the Maryland Institute Fairs, will afford them very great advantages in introducing their articles to the public, as there will congregate a great number of persons from every part of the Union. Circulars and any information required will be promptly furnished by application, post paid, to John S Selby, Actuary. THOS. TREMBLE, Chairman of Exhibition Com. 40 6

A GOOD CHANCE FOR MANUFACTURING—A Water Privilege of ten feet fall, on a never-failing stream, with four acres of choice land, in the town of Cornwall, Orange Co, N. Y., 5 miles from the North River, and three miles from the railroad depot, and on the line of survey of the Albany and Hoboken RR. For particulars inquire of John J Vanduzer, 184 Canal st, N. Y., or John Orr, on the premises. 40 13*

McALLISTER & BROTHER—Opticians and dealers in mathematical instruments, 48 Chesnut st, Philadelphia Pa. Mathematical instruments separate and in cases, Protractors, Spacing Dividers, Drawing Pens, Ivory Scales, Tape Measures, Salometers, Bourdon Steam Gauge, Spy Glasses, Microscopes, Hydrometers, &c., &c. An illustrated and priced catalogue will be sent by mail free of charge. 39 6m*

THE RIDER WATER WHEEL—Is extensively made by G. T. McLAUTHLIN & CO., sole assignees, at Plymouth, Mass, office in Boston at 108 State st. We know of no wheel so admirably combining, simplicity, power, durability, and true economy in the use of water: it is adapted to all descriptions of work, and to high or low falls, with or without backwater. More Agents wanted. 1*

FRANKLIN, N. H., Oct. 22, 1852.
Messrs. G. T McLauthlin & Co., Sirs:—It gives us great pleasure to state that the Rider Water Wheel we purchased of you gives us entire satisfaction, even beyond our expectations. We have in our paper mills the Howd or United States, the Tuttle and Wilson's spiral vent wheels, neither of which will bear any comparison with the Rider Wheel. We think the Rider Water Wheel is the most powerful and durable wheel that can be got up for the same money. PEABODY & DANIELS. 1*

EUROPEAN PATENTS—MESSRS MUNN & Co. pay special attention to the procuring of Patents in foreign countries, and are prepared to secure patents in all nations where Patent Laws exist. We have our own special agents in the chief European cities, which no other American Agency has, we believe; this enables us to communicate more directly with Patent Departments, and to save much time and expense to applicants.

E. A. BOURRY & H. E. ROEDER—Consulting and Mechanical Engineers; Office No. 333 Broadway, New York City. 43 9*

AMERICAN PIG IRON—Of the brands Wm. Penn, Swede, Amenia, Durham, Allentown, Sterling, Crane, and Mount Hope—also Scotch Pig Iron of favorite brands constantly on hand and for sale by G. O. ROBERTSON, 135 Water street, cor. of Pine. 43 8*

IMPROVED CHUCK.—We, the undersigned, being engaged in the manufacture of an Improved Universal Screw Chuck, so arranged as to work the jaws together or separately with other conveniences, are now prepared to attend to orders at short notice The securing of a patent is anticipated. E. B WHITE & CO. 43 6*

EXCELSIOR SAND PAPER, GLUE—Premium "Excelsior" Sand and Emery Papers; these papers practical mechanics have decided to be the best the market affords; also "Abbott's" Manilla Sand, and Match Papers, Emery Cloth, Emery of the "Prospect Mills" brand, Corundrum, Pumice Stone ground and in lump, of very superior quality; also Glue or Upton's, Cooper's, and all other brands, in quantities to suit, at the manufacturers' lowest prices, for sale by WILLIAM B. PARSONS, 290 Pearl street, (corner Beekman) N. Y 40 8*

IRON FOUNDERS' FACING MATERIALS—Viz, Pulverized Black Lead, Soapstone, Hardwood Charcoal, Anthracite, and Sea Coal, of approved quality, for sale by G. O. ROBERTSON, office 135 Water st, corner of Pine, New York. 38 8*

FIRE BRICKS—Fire Clay, Fire Sand, and Moulding Sand, for Iron and Brass Founders, for sale by G. O. ROBERTSON, 135 Water st, corner of Pine, New York. 38 8*

JAMES D. JOHNSON, Bridgeport, Ct., Proprietor of Wood's Patent Shingle Machine. Persons wishing to purchase rights or machines, can address as above. This is unquestionably the best machine in use for cutting shingles. 33tf

CIRCULAR SAW MILLS—The undersigned are manufacturing, and keep constantly on hand, "Child'z Premium Double and Single Circular Sawing Machines" The best machines in use for sawing lumber from logs of all sizes, and warranted capable of cutting more lumber in a given time than any other mill. Shafting, gearing, and all other mill work, made to order, with dispatch and in a workmanlike manner. H. WELLS & Co.
Florence, Hampshire Co., Mass. 44 6*

MODELS—Of all kinds of Machinery or Inventions made to order. Address JNO. B. FAIRBANK, 128 Fulton st, Scientific American Office. 41tf

STEAM ENGINE FOR SALE—7 horse-power, new, and in good order: also a cylinder boiler for the engine; it has been used but is in good condition; price $500; the Engine is worth the money. Address MUNN & CO., Scientific American Office.

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SCIENTIFIC MUSEUM.

The Natural Sciences.

The series of articles on Entomology which have appeared in our columns, are complete in this number. They are designed, we believe to inspire a taste for the study of this beautiful and useful science, in the minds of a number of our younger readers. It is not possible to enter extensively and minutely into this science in any newspaper, and indeed this is not the design of periodical literature. The object of a scientific periodical is like that of preacher, to bring forth things new and old out of the treasury of knowledge, and to act the part of a faithful monitor in spreading the truth abroad, to illumine, instruct, rebuke, and encourage. The articles of Mr. Orton, on Entomology, are written in such a clear and compact style that very few words of more than two syllables are found in them—"much in little" has been the author's motto.

Science consists in a systematic arrangement of facts, and as the natural sciences are all dovetailed into one another, a knowledge of one is useful to an acquaintance with another. The wild flora of a country affords a valuable indication of the nature of the soil; the rush tells the intelligent farmer that good land is rendered useless for want of proper draining; and thus a knowledge of Botany is useful to the farmer. It is the same with Entomology; it is more than a mere picture catalogue of beetles and shining flies, especially a knowledge of those insects which are known to be injurious to the grasses, grains, and fruits of our fields and orchards. The information of Linnæus enabled him to teach his countrymen how to destroy an insect (the Cantharis Navalis) which had cost the Swedish government a vast amount by its ravages on the timber of one dock-yard only. After its metamorphis, and the season when the fly laid its eggs were known, all its ravages were stopped by immersing the timber in water during that period. Insects exercise a great influence for good or evil over the condition of man, and they are surely worthy of his attentive today. "The study of natural history," as Alexander Wilson, the first American Ornithologist—a poet by nature—has said, "enables us to derive from objects that everywhere present themselves in our rural walks, not only amusement and instruction, but the highest incitements to piety and virtue." "If it had no other object," says Dr. Ruschenberger, U. S. N., "than to familiarize man with the wonders of Creation, intelligent people must perceive in this a sufficient inducement to encourage its study."

There is an "American Academy of Natural Sciences" in Philadelphia, but we are convinced that this fact is known to but a small minority of our people. The fault may be in the Society; it at least makes little noise in the world, far less indeed than it should do in justice to itself. It has a noble library of 13,000 volumes, and a fine Museum containing 148,876 specimens of Natural History. It was founded by some noble and generous men, such as Thomas Say, Dr. Hare, William McClure (the pioneer of American Geology, who gave $25,000 towards building the Hall of the Academy, and made many donations to the funds and to the Library and Museum), and some others. An institution of this kind should publish an annual or semi-annual account of its proceedings—its light should not be hid under a bushel. We thus speak of it, because we believe it should exercise more influence for good among our people, in the cultivation of the sciences to which we have particularly alluded in this article.

The Reproduction of Engravings.

Among the 2 000,000 of unproductive beings which are supported in Europe at public expense, to parade public places and amuse the idle, M. Niepce de St. Victor is an exception. Captain of the guards at Paris, he employs his leisure hours at the barracks in extending the domain of photography, and continues thus in the course which his uncle, Niepce, opened by the part which he took in the invention of the daguerreotype. Numerous discoveries have preceeded from his researches. He has just now completed a work, the first part of which appeared in 1847, treating of the effect of using different vapors, and especially that of iodine, in photography. He has shown that the vapor of iodine diffuses itself over the black lines in an engraving, to the exclusion of the white, and that we may reproduce the image on paper prepared with starch, or on glass covered with it, and thus form a design, the colored part of which will be iodide of starch. These designs are however not permanent. But M. Niepce has pursued the subject, and by the following method they are rendered unalterable:—

If the design obtained as just mentioned is plunged into a solution of nitrate of silver, it disappears; but on exposing the paper or glass for some seconds to the light, the original design of iodide of starch is changed into iodide of silver; and by further exposure to the light, this iodide, being much more sensitive than the nitrate of silver contained in the paper or in the layer of starch on the glass, is acted upon before the nitrate; it is then only needed to plunge the glass or paper into a solution of gallic acid to bring out the original design, which is then treated with hyposulphite of soda, just as for photographic pictures. The pictures are thus rendered as permanent as ordinary photographs.

(For the Scientific American.)

Entomology.

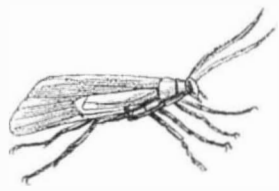
[Concluded from page 344.]

X.—Diptera—(Two-winged.)

Stratiomys Chameleon.

In number of species and individuals, this is an extensive order; some are of great service in removing decomposed matter; others are so annoying to man and beast, that Aristotle said, the Hymenoptera have their sting in the tail, and the Diptera in the mouth. Few are over an inch long, and most are of a dull color they have two slender spiny organs termed poisers, and kept in constant vibration. The larva is usually a cylindric footless grub. The Nemocera have six-jointed, antennæ, and contain the Harry-long legs and Gnat tribe; the larva of the former is aquatic, and called Hessian fly or midge, or terrestrial, and termed tailor, crane fly, etc. The Hessian was first noticed in '76, on Long Island, and it oviposits in the corolla of wheat, and hence very injurious. Gnats have long legs, tufted antennæ, narrow wings, and light bodies; their larvæ breathe through the tail; the females only attack man, penetrating the skin by delicate lancets, sucking the blood by a proboscis, and returning a venomous fluid to mollify its food. Mosquitoes are a larger variety, they bear any degree of heat or cold. Their wings vibrate 3000 times per minute; in warm climates they are very venomous and powerful, and there is a story that they pierced through Gen. Washington's boots: the horse-chesnut is said to drive them away. The Notacantha are small, but gaily colored. The Tanystoma are carnivorous or insectivorous, and have three-jointed antennæ; here belongs that distinguished torment—the gad-fly or breeze—of whom even the lion is afraid. Here, too, the female, the blood-sucker; the male living on honey; the athericeral tribe is chiefly herbiverous, but the larvæ are voracious for animal matter; one family resembles the bee, and the caterpillar is called rat-tail. The Fly tribe in Europe numbers over 1700 species; they have winglets, and their larvæ are known as maggots; some of which are useful in cleansing, others mine the interior of corn-roots, and breed in some of our eatables; these are the first tormen in Spain, Italy, and the south of France, and so annoying that Foscolo called them one of his three miseries of life. The common house-fly makes 600 strokes per second with its wings, and passes over five feet, and Delisle saw a very minute fly run three inches in a semi-second, making 540 steps. Bot-flies have no mouth, are very hairy, and of a brown color; they are seldom seen, as they live but a short time, but the larvæ are always found in living animals, burrowing into the flesh and causing tumors. One species is appropriated to man, and penetrates the abdomen. The Pupipara are parasitic, and their eggs are hatched in the matrix, and not excluded till they are pupæ The Forest or Spider-fly is small and bristled, and runs like a crab; they have a serrated haustellum like a barbed sting; they are called ticks or sheep-lice when infesting those animals; the eggs are laid in the inner edge of the nostrils, whence the maggots ascend and feed in the maxillary and frontal sinuses. A wingless and eyeless species annoys the bee. Those found on bats resemble spiders.

XI.—Tricoptera—(Hairy-winged.)



Phryganea Grandis.

The larvæ of these insects are known as caddice-worms;" they may be seen at the bottom of shallow water, resembling pieces of wood or stone; they inhabit cases, sometimes pyriform, polygonal, and horn-shaped or at others in the form of a fluted cylinder or spirally-rolled ribbon; these they carry with them, protruding a short distance, but withdrawing on alarm, although a close fit to the body, the insect has the power of turning round it. Its proficiency in hydrostatics is shown by its attention to the specific gravity use of its house, to which, if too heavy, a bit of straw is glued, or, if too light, a pebble: when perfect, the image (represented above) never measures more than two inches in the expanse of the wings; it takes no food, and lives only long enough to be sure of posterity. It is often attracted into houses by the candles, in the evening, and smells disagreeably whenever touched.

XII.—Strepiptera—(Fan-winged.)

Xenos Peckii.

This singular group is too anomalous for classification; the larvæ are parasites on the abdomen of bees and wasps, have no feet, no mouth, and absorb juices through the skin; the insect never exceeds a quarter of an inch in length, and is sexless, takes no nourishment, and lives but a short time; the greater part of the body is made up of the thorax Instead of anterior wings, there is a pair of nondescript organs, which some call pre-balancers—the only instance where the first pair is undeveloped when there are only two wings present.

J. Orton.

Hydrostatic Question.

Suppose a vessel 3 feet in diameter, filled with water, but another vessel, one foot in diameter, placed inside of the former, and it full of water, so as to leave 24 inches of water outside of the inner vessel,—will there not be double the amount of pressure on the outside than on the inside of the inner vessel? An answer to this question will much oblige yours,

C. W.

Philadelphia, Pa., 1853.

[No there will not be double the pressure on the outside that there is on the inside of the small vessel. Why? Because water presses equally on all sides; there are as many sides on the outer as on the inside of the small vessel, and just as many square inches on each side (not allowing of the difference for the construction of the box.) It there was double the amount of pressure on the outer as there were on the inside, then the pressure on the square inch would be double on the outside and would be a violation of that law of hydrostatics, "the pressure is as the perpendicular height."

Crayons for Writing on Glass.

Brunnquell prepares crayons for writing on glass, so as to enable the contents of glass vessels to be described immediately upon them in the following manner:—Take four parts of spermaceti (or stearine) three parts of tallow, and two parts of wax are fused in a cup; six parts of minium and one part of potash are then stirred into it, the mass may be screwed up and down in the tube, and cut to the finest point with a knife. A crayon is thus obtained which will readily write upon clean dry glass.

Mode of obtaining Positive Potographic Impressions upon Plates intended for Engraving.

The method employed by A. Martin is the same as that which he described for taking positive pictures on glass. The metallic plate, covered in the usual manner (but upon both sides) with etching-ground, is first coated with iodized collodion, then dipped in the solution of nitrate of silver, &c. The picture, when taken, is freed from the unmodified iodide of silver by the bath of cyanide of silver washed with water, immersed in a solution of dextrine, and dried. The engraver may then make the same use of the design that he does of the outline, which is usually transferred to the etching ground. A second impression on glass will preserve the design, which the operation of engraving will destroy upon the plate.

Impressions taken in this way upon varnished metallic plates of any kind, or even upon a cardboard, unite with the qualities of positive impressions upon glass, a strength and facility of transport of which the latter are deficient. The method is also applicable to wood blocks.—[Comptes Rendus.

Guano on Wheat.

The "Fredericksburg (Va) Her." states that the effects of guano are quite visible on several crops of wheat between that city and Spotsylvania Court house. Land that heretofore was scarcely worth the seeding, looks as though twenty to twenty-five bushels might be gathered the approaching harvest.

Peach Trees.

Tobacco leaves put around the body of peach trees, just beneath the surface of the ground, are recommended as a preventive of the worms that destroy the trees by eating the bark

LITERARY NOTICES.

Littell's Living Age—No. 14, the first number of the second volume, new series, of this excellent weekly magazine commenced with the first of this month. It would be a work of supererogation for us to speak of the merits of the "Living Age." The first article in this number is "America from a Cosmopolite View;" it should be read by all our own people.

MECHANICS

Manufacturers and Inventors.

A new Volume of the SCIENTIFIC AMERICAN commences about the middle of September in each year. It is a journal of Scientific, Mechanical, and other improvements; the advocate of industry in all its various branches. It is published weekly in a form suitable for binding, and constitutes, at the end of each year, a splendid volume of over 400 pages, with a copious index, and from five to six hundred original engravings, together with a great amount of practical information concerning the progress of invention and discovery throughout the world.

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We particularly warn the public against paying money to Travelling Agents, as we are not in the habit of furnishing certificates of agency to any one.

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